The discovery of interferon in 1957 by Isaacs and Lindemann* provided a ray of hope. Here was a potent inhibitor of the replication of many different viruses and one which was non-toxic for host cells. If such material could be produced on a large scale, it might be the long hoped-for universal antiviral drug. Regrettably, the early hopes and expectations were not fulfilled. The pronounced host-specific effect of interferon limited its potential application and the small yield of interferon in laboratory systems posed apparently insuperable difficulties for commercial production. For these and other reasons, *exogenous* interferon has been largely abandoned as a potential antiviral drug.

On the other hand, it was discovered that a wide variety of substances was capable of inducing the formation or release of *endogenous* interferon made by the host's own cells. Some inducers were relatively simple molecules, some were non-antigenic and could therefore be given repeatedly, many were non-toxic. This provided a powerful new stimulus for the investigation of the physical, chemical, and biological properties of interferon and its potential in therapy. Elsewhere in this journal, Dr. T. Merigan, a leading investigator of interferon, presents a detailed and critical appraisal of some recent developments in this area.

It seems probable that endogenous interferon, stimulated by virus infection, plays an important role in limiting viral proliferation in an infected tissue and thus limiting injury to tissue. Interferon appears to be an important mechanism in bringing viral disease to an end. By contrast, preformed antibody (for example, after vaccination or post infection) may prevent infection by a given specific virus, but plays little part once an infection has established itself. It is tempting to believe that stimulation of endogenous interferon by non-toxic and non-immunogenic inducers could be employed in many viral infections to abort or prevent disease. In view of the broad spectrum of viruses suppressed by interferon, it would not even be necessary to formulate a specific viral diagnosis before employing this agent—at times an appealing thought. These possibilities are so attractive that large pharmaceutical manufacturers are intensively pursuing research in these directions. In the immediate future, however, such a universal antiviral compound is not in sight for the practitioner. Most clinical trials with exogenous interferon have given marginal results and some of the more dramatic claims for the clinical efficacy of interferon-inducers (especially from the U.S.S.R.) require confirmation.

For the molecular biologist, interferon offers an exciting challenge, permitting glimpses into the cell's mechanisms which transmit information and control synthesis of viral components. It appears at present that interferon acts upon ribosomes where active protein synthesis takes place. It is reasonable to predict that knowledge about the molecular biology of interferon will accumulate faster than its practical application in medicine. Nonetheless, the dream of a universal antiviral treatment may come true through progress in this field of investigation.

*Isaacs, A., and Lindemann, J.: Virus Interference, I. Interferon. Proc. Roy. Soc. (London), 147:258-267, 1957.

Medicine and Human Behavior

AS THIS IS WRITTEN another assassin's bullet has snuffed out the life of another American of courage and outspoken conviction. Perhaps the assassin was demented, perhaps an opportunist, or perhaps a person of courage with his own peculiar conviction. An anguished nation is asking itself why, what is wrong, and how can violence be curbed, whatever its cause. There is something awful about the present capability of a minority of one human being to affect the lives of so many, whether his finger is on the trigger of a gun or on a button which could unleash a nuclear holocaust.

This is not the place to explore the extent to which a minority, whether an individual or a group, whether advantaged or disadvantaged, whether black, white or some other color or race, should have the power or the right to impose its will upon a civilized nation, upon the civilized world, or even upon a simple majority of whatever group. Nor is this the place to examine the concept of the protest—that theory which says that if I believe I know what is right then I have a responsibility to bring about what I believe to be right even if I have to violate a law to do so, and that what I am doing is so right and so important that it doesn't matter if I have to deny others the same rights and privileges I claim for myself in order to get it done. This concept not only underlies the illegal protest, whether violent or nonviolent, but it is also the blind conviction of extremists of both the political right and left.

These are, however, matters of human behavior, and medicine therefore is appropriately concerned. Behavior is an important factor in health maintenance, in seeking health care when it is needed, and in many other aspects of well-being or being well. It is important in the causation of disease, injury and emotional disturbance whether in individuals, groups of individuals or even crowds. And surely an understanding of human behavior is important when there is a human finger pressing on an individual trigger or a global push button.

But biological and medical science knows all too little of these phenomena. Certainly genes have something to do with it. Nutrition has something to do with it. Life's experience, the "conditioning" process, culturally accepted behavior, one's own "thing," the comfort of comformity, and personal conviction are each important. For the animal kingdom, behavior is recognized as a biological phenomenon and its nature is properly studied within the framework of the life sciences. It has been said that in humanity life has become aware of itself, but certainly this late evolutionary awareness has not changed the basically biological nature of human beings and human behavior.

It is suggested that the time has now come, both in the nation and in the world, for the principles and technology of biology and medicine to be focused more directly upon human behavior. It is suggested that a biological approach now be introduced into the behavioral, social and political sciences and that these scholarly disciplines begin to take more cognizance of the biological nature of the subject matter with which they deal. As knowledge of the basic biological nature of human behavior and human society accumulates it will become possible to apply many of the principles of medical practice to problems of health and disorder in human behavior, not only in individual persons, but in civilized society, and its many segments in the community, in the nation and throughout the world. Only when and as this is done will the human achievement of awareness of life be matched by the science and techniques necessary to understand and promote civilized behavior among human beings in a civilized world.

A New Director of Public Health

Just at press time we have the pleasure of expressing our well-wishes to Louis F. Saylor, M.D., M.P.H., upon his appointment as California's Director of Public Health.

Dr. Saylor, who has been with the Department of Public Health for the past seven years as assistant chief of the Division of Research, comes to a post that traditionally has been served by men of outstanding ability and we believe he will extend that tradition.

With our congratulations to him goes our earnest offer of cooperation and assistance.